



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,159	11/17/2003	Damian A. Hajduk	1012-138c1 (2000-059CON1)	4123
7590	08/19/2004		EXAMINER	DEB, ANJAN K
Christopher J. Voci Dobrusin & Thennisch PC Suite 311 401 South Old Woodward Avenue Birmingham, MI 48009			ART UNIT	PAPER NUMBER
			2858	
				DATE MAILED: 08/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/715,159	HAJDUK ET AL.
	Examiner	Art Unit
	Anjan K Deb	2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 04 December 2003 and 06 July 2004.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-14 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-14 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 17 November 2003 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date 07/06/2004.

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a sensor region and an actuator region that are separate structures connected to each other by a platform (as in claim 14) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 4, 9, 10, 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, 4, it is not clear how “the electrode” is used both for applying a voltage and for sensing. A further clarification is required.

Re claims 9, 14, it is not clear how one piezoelectric element may include two separate structures connected to each other by a platform (see drawing objection above). It appears each structure comprise a piezoelectric element that are connected by a platform.

Re claim 10, the material properties sensed (selected from a group consisting of flexure, uniaxial extension, biaxial compression, shear, stress and strain at failure, toughness, Young's modulus, complex modulus, and a combination thereof) pertain to solids, therefore it is not clear what properties of semi-solids and liquids are sensed.

### ***Double Patenting***

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground

provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-14 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 10-18, 22-25 of U.S. Patent No. 6,650,102 B2.

Although the conflicting claims are not identical, they are not patentably distinct from each other because they are broader in scope and encompass all of the claimed limitations.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 1-14, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Tschoegl (US 3,933,032).

Re claims 1,10 Tschoegl discloses method for sensing a mechanical property of a material 28, comprising providing a supporting member containing at least one piezoelectric element, placing a material 28 onto the piezoelectric element (top plate 23 of piezoelectric stack)(column 2 lines 1-38) wherein the material 28 is selected from a group consisting of solids, semi-solids, high viscosity fluids, and a combination thereof (polymeric material), directing a force from the piezoelectric element (23), applying voltage to piezoelectric element to create

force (column 1 lines 64-68), and monitoring a response of the material to the force with at least one response sensing device (32), wherein the response of the material is indicative of a mechanical property (column 3 lines 34-40).

Re claim 2, Tschoegl discloses 0.05 inch thick material (column 3 lines 46-47).

Re claims 3, 8, Tschoegl discloses mechanically securing material to piezoelectric element (column 2 lines 17-23).

Re claim 4, Tschoegl discloses piezoelectric response sensing device (pick up transducer 32) (column 2 lines 28-38).

Re claims 5,12 Tschoegl discloses piezoelectric element (piezoelectric stack) broadly interpreted as bender comprising ceramic disc.

Re claims 6-7,13 Tschoegl discloses securing electrode to backing plate (column 1 lines 64-67, column 2 lines 5-7).

Re claim 11, Tschoegl discloses regulating environmental conditions of the material (column 3 lines 50-51).

Re claims 9,14 Tschoegl discloses piezoelectric element includes a sensor region and an actuator region that are separate structures connected to each other by a platform (column 1 lines 18-25, column 2 lines 17-38).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-8, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (US 5,245,876) in view of Kiraly (US 4,400,642).

Re claim 1, Jones discloses method for sensing a mechanical property of a material, comprising providing a supporting member containing at least one piezoelectric element 26 placing a material 23 onto the piezoelectric element (beams 11, 12 coupled to piezoelectric element 26) wherein the material is selected from a group consisting of solids, semi-solids, high viscosity fluids, and a combination thereof (polymeric material sheet), directing a force  $F(t)$  from the piezoelectric element, and monitoring a response of the material to the force with at least one response sensing device (29), wherein the response of the material is indicative of a mechanical property (column 3 lines 8-27).

Jones did not expressly disclose piezoelectric element having an electrode and applying a voltage to the piezoelectric element through the electrode. However, piezoelectric types of

actuators are well known in the art that exert force by bending or changing its shape when a voltage is applied to a piezoelectric element.

Kiraly discloses piezoelectric element 14 having an electrode (18,20) and applying a voltage (22) to the piezoelectric element through the electrode (Fig. 1).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Jones by adding an electrode and applying a voltage to the piezoelectric element through the electrode disclosed by Kiraly for applying mechanical force (stress) to a material without using discrete motive components (see Kiraly, column 3 lines 55-65).

Re claim 2, Jones discloses material having thickness of 500 microns (0.1 to 5 mm)(column 3 lines 1-2).

Re claim 3, Jones discloses mechanically securing material to piezoelectric element (column 2 lines 65-68).

Re claim 4, Jones discloses optical response sensing device (column 5 lines 37-40) broadly interpreted as optical interferometry.

Re claims 5-8, Jones discloses material under test is attached to plate (18,19) but did not expressly disclose piezoelectric element is a bender.

Kiraly discloses piezoelectric element 14 is a bender (Fig. 2-5).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Jones by adding piezoelectric bender disclosed by Kiraly for applying force to material under test (see Kiraly: column 3 lines 55-65).

10. Claim 9-14, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (US 5,245,876) in view of Olness et al. (US 4,906,917).

Re claims 9, 10, 14 Jones discloses a method for sensing mechanical property of a material (Young's modulus) comprising providing a supporting member containing at least one piezoelectric element (column 3 lines 8-18) to create a force, monitoring a response of the piezoelectric element to the force with at least one response sensing device 29 selected from a group consisting of an optical response sensing device comprising optical interferometry (optical vibrometer), placing a material 23 onto the piezoelectric element by mechanical means, electromechanically, chemically, and a combination thereof, wherein the material is selected from a group consisting of solids, semi-solids, high viscosity (polymer sheet).

Jones did not expressly disclose piezoelectric element having an electrode.

Olness et al. disclose piezoelectric sensing device having electrode for measuring Young's modulus (elasticity) of elastomeric material (column 2 lines 55-68, column 3 lines 1-30)(Fig. 1).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Jones by adding piezoelectric sensing device having an electrode disclosed by Olness et al. for measuring Young's modulus (elasticity) of elastomeric material.

Re claim 11, Jones discloses regulating environmental conditions of the material (column 4 lines 54-60).

Re claim 12,13, Jones discloses material under test attached to plate (18,19) broadly interpreted as backing plate.

Re claim 14, as best understood, while Jones discloses piezoelectric element includes an actuator region 26, and a sensor region 29 that are separate structures connected to each other by a platform 13, Jones did not explicitly disclose that the sensor region also includes a piezoelectric element.

Olness et al. disclose piezoelectric sensing device having electrode for measuring Young's modulus (elasticity) of elastomeric material (column 2 lines 55-68, column 3 lines 1-30)(Fig. 1).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Jones by adding piezoelectric sensing device having an electrode disclosed by Olness et al. to the response measurement device of Jones for measuring Young's modulus (elasticity) of elastomeric material.

***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Atalar et al. (US 5,908,981) discloses piezoelectric array for measuring material mechanical property including stress, and Young's modulus.

Schultz (US 6,004,617) discloses method of measuring mechanical property of material comprising regulating environmental conditions of the material (temperature control).

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le, can be reached at (571) 272-2233.



<b>Anjan K. Deb</b>	Tel: 571-272-2228
Patent Examiner	Fax: 571-273-2228
Art Unit: 2858	E-mail : <a href="mailto:anjan.deb@uspto.gov">anjan.deb@uspto.gov</a>

8/10/04